# The Human Capital–Intensive Firm and Coordination: Redefined Integration and Disintegration

by
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*The aim of this paper is to reconsider the link between integration and disintegration. We argue that the conception of this link depends on the way one defines the firm and its coordinating role. We focus on studying the human capital-intensive firm. We explain that coordination by this kind of firms consists in coordinating productive tasks. The role of the firm is to coordinate the specialization of complementary resources and the division of labour. We show that integration and disintegration must be differentiated by the tools they give to the firm to effectively govern productive assets.* (JEL: D23, L22, L23)

## *1 Introduction*

Vertical integration is one of the main issues of the analysis of industrial organization. In an historical perspective, the literature has often put the emphasis on successive movements of vertical integration and disintegration (CHANDLER, 1977; LANGLOIS, 2003)[1]. This tendency to historically contrast integration with disintegration can be explained in an analytical way. Since the seminal work of COASE [1937] on the existence and the nature of the firm, many economists have interpreted the link between integration and disintegration as the consensual opposition between hierarchy and market (WILLIAMSON, 1975, 1985; KLEIN ET *AL.*, 1978). Economists describe integration and disintegration as alternative means to coordinate productive activities. In an institutional perspective, the division of labour is ensured, on the one hand, by hierarchies, and by the price system, on the other hand. Integration and disintegration are the two polar modes of coordinating economic agents. The perception of vertical disintegration as the analytical opposite of integration is based on the vision of the firm as a combination of physical assets commonly owned. As modelled by the Incomplete Contracts Theory, the ownership of physical assets determines a planed coordination by firms whereas the non-ownership corresponds to a spontaneous coordination by markets.

The traditional theory of the firm based on the property rights perspective as formalized by HART AND MOORE [1990] and HART [1995] can be criticized by taking into account the importance of human assets in the production process of firms (RAJAN AND ZINGALES, 2000; ROBERTS AND VAN DEN STEEN, 2000; MINEFI, 2005). BLAIR [1995, p. 292] states "a knowledge company's primary resource and principal competitive advantage is the knowledge that its employees possess …". Abilities, skills and knowledge developed both by internal workers and external stakeholders of the firm characterize a significant corporate

1 During a same period, the thesis of massive adoption of a unique organizational form has been criticized by LAMOREAUX ET *AL.* [2003]. These authors explain that the modes of vertical organization do vary from firm to firm and from industry to industry.

added value of innovative strategies of the productive entity. For example, business services firms in data-processing and in telecommunications produce 72% of the added-value of the French sector of Information and Communication Technologies (SESSI, 2005). It indicates that firms built around agents' resources produce 72% of the added-value of the sector. By comparison, the production of computers represents only 3% of the added value of the same industry. These data suggest that human capital-intensive firms tend to be more and more important in economic activity.

The aim of this paper is to re-consider the link between vertical integration and disintegration on the basis of an understanding of modes of coordination within the human capital-intensive firm.

We focus on analyzing entrepreneurial firms whose productive activity is built around the human capital of its key partners. One can say this case is a restrictive one but we believe it concerns numerous firms. Especially, it concerns business service firms.
On the basis of an original vision of the human-capital-intensive firm, we suggest a new definition of the relationship between integration and disintegration, overcoming the traditional dichotomic vision. A change in the central subject of coordination (human assets rather than physical assets) involves reconsidering modalities of coordination (specialization of tasks rather than property of assets). It thus involves re-examining the link between integration and disintegration (integration and disintegration are not viewed as two opposite institutional modes of coordination). We argue that integration and disintegration must be differentiated by the tools they give to the firm so that it can effectively govern the productive specialization of its human assets.

The outline of the paper is as follows. Section 2 describes the dichotomic conception of the link between vertical integration and disintegration. The alternative "hierarchy/market" as the mode of coordination is based on a vision of the firm exclusively defined as a structure of property rights. Section 3 questions the relevance of this vision developed by the Incomplete Contracts Theory by examining the problem of coordination in a human capital-intensive firm. The hierarchical organization, power stakes and the model of governance of a firm based on its human assets lies on the management of the specialization of agents rather than the allocation of property rights. On the basis of this enriched vision of the coordinating role of the human capital-intensive firm, we propose in section 4 a new analysis of integration and disintegration. We conclude that the relationship between integration and disintegration must be understood as a combination of instruments available to a unique mode of coordination, the specialization of agents within the functional boundaries of the firm.

## *2 The Firm as a Legal Structure of Property Rights*

### *2.1 Questioning the Foundations of Contractual Theories of the Firm*

Scholars have long ignored the firm as a very important agent of the economic analysis. They focused on studying market and described it as the only and optimal mode of coordination of economic activities. The seminal article of COASE [1937] bases the existence of the firm on market informational imperfections. And Coase justifies the superiority of the firm by emphasizing the price system fails to coordinate effectively economic activities. Economic institutions, like corporations, would be able to save some transaction costs due to productive activities (COASE, 1937; WILLIAMSON, 1975, 1985). Besides, the tendency of firms to create market value through productive transactions matters as far as two dimensions are concerned. The surplus-sharing, on the one hand, and uncertainty concerning the realization of this surplus, on the other hand, are the two main problems arising from the productive activity of firms.

Later research (GROSSMAN AND HART, 1986; HART AND MOORE, 1990) explains transactions costs are due to a problem of strategic expropriation of relational quasi-rents: this is the so called hold-up risk induced by underinvestments. The Incomplete Contracts Theory focuses on efficiency considerations and incentives structures to deal with hold-up problems. More precisely, the Incomplete Contracts Theory comes down to two main assumptions:

- The coordination of two agents in a productive transaction amounts to a problem of incentives; what only matters is how to encourage agents to make efforts and how to solve the corresponding hold-up problem;
- The hold-up problem can be overcome by giving the set of residual rights of control to a unique agent. This solution supposes this agent legally appropriates the assets of the firm. In other words, the firm is defined as a combination of assets legally and commonly owned.

The Incomplete Contracts Theory considers ownership as the way to address potential hold-ups and incentives alignment in a world of incomplete contracting and divergent interests (HOLMSTROM AND ROBERTS, 1998).

In this context, vertical integration is associated with a need of planed coordination in the production process. Vertical integration is the organizational solution to buffer hold-up threats. Reciprocally, vertical disintegration can be viewed as a spontaneous coordination by markets where assets remain separately owned. The analytical link between vertical integration and disintegration is considered in a bipolar way: sometimes the firm, sometimes the market, is privileged in order to coordinate industrial activities.

This analysis seems not to be pertinent in regard to the current industrial context. The last twenty years have been characterized by a large movement of vertical disintegration (LANGLOIS, 2003; LEIBLEIN AND MILLER, 2003). Many stages of the production process are outsourced so that inter-firms relationships have greatly and rapidly increased. In 2003, 81% of French firms of more than 20 employees declared keeping up at least one cooperation relationship; 70% of these firms communicated that this kind of relationships was durable (more than five years) (SESSI, 2005). Besides, inter-firms relationships have changed in the way companies are linked. A lot of work on the emergence of the network-firm testifies the recent growth of market relations (LANGLOIS, 2003; BAUDRY, 2004; FRIGANT, 2005). Yet, disintegration does not necessarily correspond to a new development of anonymous and spontaneous market relationships. Industrial restructuring has come with a strengthening of the influence of leader firms in the economic system. This monopolization process does not suggest a return of market coordination; it rather highlights the structuring role of big firms in the organization of markets.

This apparent "paradox" can be understood by re-founding the nature and the role of the firm. More precisely, we must go beyond the vision of the firm as a combination of fixed assets commonly owned. In this perspective, we can overcome the traditional dichotomic conception of the relationship between vertical integration and disintegration. We propose to explain integration and disintegration as two different modalities of a same coordination process controlled by the firm. To do so, we show that the firm effectively governs its productive activity and actively organizes the division of tasks with different tools given by vertical integration and disintegration.

Two perspectives can be explored to develop this argument by questioning the two main assumptions stated above.
First, the contractual problem of rents expropriation is not the only one. The historical controversy around General Motors – Fisher Body case (COASE, 2000; KLEIN, 2000; FREELAND, 2000; CASADESUS-MASANELL AND SPULBER, 2000) illustrates, for example, that vertical integration is especially chosen in order to coordinate the production process. The contractual aspect is of secondary importance in the choice of vertical integration. For Christensen, VERLINDEN AND WESTERMAN [2002], the choice of the institutional form depends on a need of explicit technological coordination between agents. This choice varies with the degree of innovation of the goods produced. As a result, questioning the first assumption stated above corresponds to an external criticism of the Incomplete Contracts Theory. The coordination challenge is not a problem of incentives alignment. The nature of the coordination problem must be revised. Yet, this line of attack is not the issue of this paper.
Next, the second assumption can be critically examined but in an internal way. The hold-up problem and more globally investments incentives issues are recognized as central questions. It is however possible to discuss that the firm, as a set of physical assets under common ownership, is up to solve these problems. This is the argumentation of MASKIN AND TIROLE [1999]: without referring to the firm, complete private contracts can be re-established to ensure incentives alignment. In this context, there's no *raison d'être* to the firm.
The internal criticism can be addressed in another way. In this paper, we suggest that the firm is the solution to the hold-up problem but not as a unified structure of property rights. The role of the firm is obviously to regulate the hold-up problem but in a different way, on the basis of an active and enriched coordination of the specialization of agents. This conception of the coordinating role of the firm results from dealing with the management of human assets in a contractual theory of the firm.

### *2.2 Rethinking the Hold-Up Problem: the Importance of Specific Human Capital*

In the contractual framework, the hierarchy is a solution to the hold-up problem, given the opportunistic nature of human actors and the specificity of fixed assets required for efficient production. As an authority of coordination, the firm motivates agents who take part in the productive activity. However, the contractual framework focuses on the notion of ownership of physical and transferable assets. Such an approach of the firm argues away the possibility of a hold-up based on human capital, because of hypotheses which seem questionable.
In the Incomplete Contracts Theory, the power due to the existence of specific human assets affects neither the design of incentives systems nor the coordination of productive activities. Therefore, the Incomplete Contracts Theory overshadows the assumption of a hold-up problem arising from human assets. It takes into account the human dimension but in a very restrictive way. Human assets are always subordinated to the development of physical assets. For example, the transfer of physical assets necessarily induces the transfer of human assets. Corporate knowledge does not depend on a unique individual but on a set of partners (KLEIN, 1991). In this context, the problem of quasi-rents expropriation arising from human capital disappears via the assumption of knowledge dispersion.

Moreover, when property rights on physical capital are reallocated, the control of human capital is indirectly but concomitantly altered. The level of skills, abilities and competencies reached by employees necessarily depends on a fixed capital specific to the firm. It follows that the possibility that a worker attempts to expropriate a part of organizational rents is ruled out. Human capital is only valuable when it is combined to a firm-specific physical asset. In this perspective, when property rights are redistributed, workers simultaneously “transfer” their specific human capital. Workers follow the reorganizing movement and carry on their productive effort in the same previous conditions. HART [1989] notes that control of physical capital can lead to control of human assets in the form of organizational capital.

Yet, we believe it is difficult to subordinate the importance of human assets to physical assets. Competition has increased, technological change has been advancing at a stronger pace and finance has been made more widely available. In this context, innovation has gained momentum and has been facilitated. Innovation usually requires workers whose human capital is specialized and specific to the firm employing them. Indeed, innovation race is necessarily conducted by valuable human capital at each stage of the production process. In this dynamic perspective, human capital has become more central in the productive activity of firms. Moreover, the development of specific human assets is strategic because according to BLAIR [1995, P. 231] “much of the wealth-generating capacity of most modern firms is based on the skills and knowledge of the employees and the ability of the organization as a whole to put those skills to work for customers and clients”. And, the great ability of human capital to capture rents makes the traditional Incomplete Contracts Theory no longer tenable. Human capital takes on intrinsic importance, beyond its complementarities with physical capital. Thus, the way to control incentives relative to human capital does differ from the way to control incentives relative to physical one.

In this paper, we propose to adapt the existing theory of the firm to an emblematic case of a human capital-intensive firm and to analyze the different methods developed to discipline human capital in this firm. Human capital, because of its immaterial and non-transferable nature, can be appropriated neither by the firm nor by any stakeholders in the firm. Indeed, referring to Grossman, Hart and Moore terminology, an agent can not promise his residual rights of control on his human capital to others through an incomplete contract for a long period. Human capital is not alienable so that contracts on its management do not give the same residual rights of control as contracts on physical capital. GIBBONS [2005] notes that two kinds of rights coexist: alienable rights on physical assets and inalienable rights on human assets. Therefore, human capital-intensive firms can not be satisfactorily defined in terms of structure of property rights. The focus on the theory of the firm must shift to studying the economic nature (and not the legal nature) of organizations (RAJAN AND ZINGALES, 2001). The vision of the firm as a combination of physical assets commonly owned must be abandoned for an improved conception of the firm based on the specialization of human assets. It is a question of reconsidering control and incentives mechanisms over assets critical to the productive activity of the firm. Thus, we analyse the coordination of human assets and the coordination of their complementarities by exploring the organization, the operating and the governance of the human capital-intensive firm.

## *3 The Human Capital-Intensive Firm: Hierarchical Organization, Power Relationships and Corporate Governance*

### *3.1 The Critical Resource Theory: the Firm as a ‘Nexus of Specific Investments*

The human capital-intensive firm must be viewed as a set of specific and mutually dependant tangible and intangible resources. This approach refers to multiple developments, and inter alia, the Resource-Based View of the firm (RUMELT, 1984; WERNERFELT, 1984; PRAHALAD AND HAMEL, 1990; PETERAF, 1993). PENROSE [1959] defines the firm as a core of capacities and unique resources. AOKI [1984] characterizes the organization as a long term combination of specific resources. However, RAJAN AND ZINGALES [1998, p. 405], developing the Critical Resource Theory, model the entity as 'a collection of commonly owned critical resources, talents, and ideas, and also the people who have access to those resources'. More precisely, ZINGALES [2000, p. 1645] states that the firm represent a "web of specific investments built around a critical resource". It would result from the combination of three distinct phenomena: power, access to resources and complementarity, which all correspond to original mechanisms crucial to understand the firm built around its key human assets.

On the basis of the Critical Resource Theory, we present a simple vision of the hierarchical organization, the division of tasks and power relationships within an entrepreneurial human capital-intensive firm. A firm builds its productive activity on a critical resource owned by the entrepreneur. This resource is decisive for the firm insofar as it enhances the development of its production process. In addition, the critical resource is a source of power for the entrepreneur who possesses it. The entrepreneur can influence his employees' human capital, and he acquires power through the control (not ownership) over his own resource. If we actually regard entrepreneur's critical resource as a key human capital (talent, skills, etc.), economic power arises from an intangible and non-transferable capital non-imitable in an instantaneously way. In this situation, the hierarchical organization gets power thanks to the ability of the entrepreneur to cause an accumulation of specific investments. In order to reach this objective, the entrepreneur needs to control access to his critical resource and to build complementarities between his critical resource and employees' human capital. Unlike the Incomplete Contracts Theory, no contract is signed on the allocation of property rights because we consider a firm whose production process is based on human capital. We argue that a non-contractual[2] agreement is rather done by giving access to the critical resource of the firm. The entrepreneur provides specialized stakeholders with an access to the firm or to his critical resource (*i.e.* its human capital) so that they can get power if they specialize themselves. In fact, by investing in human capital, stakeholders get power because they become decisive in the activity of the firm. The entrepreneur assigns access rights so that stakeholders who get access to the critical resource have the possibility to use or to work with it (RAJAN AND ZINGALES, 1998). The regulation of access corresponds to a coordinating mechanism alternative to ownership. Considering a firm typically built around its human assets, access is provided either through an employment relationship or through a cooperation agreement[3]. Once co-specificity exists between specific human assets, specialized workers adjust their investments in order not to jeopardize the joint value they can create together. Consequently, as this situation makes them dependent on the entrepreneur, employees choose to realize firm-specific investments because they know their reward will be greater if they control the critical resource of the firm. Through regulated access, an entrepreneur can shape a nexus of specific investments capable of producing more than any competitor with a similar resource hardly starting the production process. Indeed, the web of specific investments, built over time, cannot be instantaneously reproduced. The more agents specialize, the more power

2 The regulation of access includes not only access rights to the critical resource, but also the cooperation of the person being specialized to. Moreover, the regulation of access is not only a momentary action but a process that cannot be continuously verified by courts (RAJAN AND ZINGALES [1998, p. 403]).

3 The common (separate) ownership of assets is not viewed as the corollary of vertical integration (disintegration). Corollary, an employment relationship would correspond to integration and a cooperation relationship to disintegration. Analyzing the boundaries of the human capital-intensive firm involves considering the relevance of employment relationships *vis-à-vis* cooperation relationships with external stakeholders.

is maintained and increased so that at some point, the firm becomes the nexus of specific investments itself. The firm becomes the critical resource itself. Therefore, it can increase the value of the growth opportunities of the firm.

In this framework, power comes from control over human capital critical for the production process of the firm. Control over immaterial and inalienable critical capital does not refer to ownership. Control over critical capital rather involves the possibility of using or working with it. The stakeholder who is granted access does not acquire an additional residual right of decision; he can enhance his value by specializing, that is, by being a crucial "factor" in the production process of the firm. Access represents a power stake for the different stakeholders.
On the one hand, by giving access to his critical resource, the entrepreneur arbitrates his power. First, he improves market valorisation of the firm. The firm has a competitive advantage on its real and/or potential competitors. As a nexus of specific investments in human capital, it cannot be imitated instantaneously. Second, the entrepreneur enhances his power within the firm on the specialized employees. As he is the only agent to control the inalienable rights of control on his critical resource, the entrepreneur is the key element of the complementarity between human assets in the production process. Nevertheless, the entrepreneur looses some negotiation power by giving up a part of the control of the firm to stakeholders who are granted access to the critical resource.
On the other hand, stakeholders who are granted access control the nexus of critical resources so that they multiply their outside opportunities. First, specialization provides employees with a potential additional value: by accumulating knowledge and competencies within the firm they worked, employees improve the outside value of their human capital. Specialized employees systematically enhance their outside value because human capital is more "re-adjustable" than physical capital. For example, engines to paint cars cannot be transferred in a firm of the data-processing business service sector. Whereas, a computer scientist working within a business service firm can be employed in a company of the car industry, either in a similar position or for another job, without important losses of value. In fact, specialized human capital is adaptable. Yet, as human capital is non-reproducible instantaneously, it can be costly for specialized employees to value their human capital outside. There remain some costs of search for a new job, some costs relative to the supply of a weaker salary, or some costs of adaptation to the critical resource of the new firm that employs them (even if this firm has same characteristics as the previous one). In order to get back a high negotiation power within the new firm, employees must co-specialize to the members of the new production team. However, their investment efforts would be weaker thanks to the similar competences and capabilities and experience they have acquired in the first firm. Second, employees have also the residual right to leave the firm. By using and working with it, employees can control the critical resource of the entrepreneur. Control over the critical resource is *de facto* an economic source of power for central employees. This power generates in turn surplus that depends on the importance of firm-specific investments made. Thus, the regulation of access is a privileged means to promote specific investments. The regulation of access can be a more motivating mechanism and a superior mode of allocation of power than ownership in the particular case of the human capital-intensive firm.

Whereas ownership legally associates physical assets to a firm, complementarities join human assets within a team production. More precisely, by controlling access over his critical resource, the entrepreneur has the power to set and manage the collection of productive factors of which emerge synergies (ALCHIAN AND DEMSETZ, 1972). The human capital-intensive firm can be viewed as a team organization which supports productive specialization. Stakeholders federate their efforts and make their skills co-specialize in a team production.

Therefore, team work is essential in a firm considered as an authority of coordination. Indeed, via the regulation of access, synergies between employees arise from a team work where each stakeholder is decisive because of the specific investments he makes (BLAIR AND STOUT, 1999; RAJAN AND ZINGALES, 2001). Moreover, a critical resource is all the more crucial it is combined to the individual capabilities of other team members who are engaged in a particular task (BLAIR, 1995, 1999). Control over critical resources depends on the recognition of this manifestation.

The organization of the human capital-intensive firm and the corresponding allocation of power highlight potential conflicts of interest between stakeholders. Power relationships have to be controlled through an organizational mode of governance adapted to the human capital-intensive firm.

### *3.2 The Governance of the Human Capital-Intensive Firm: Main Objectives and Main Tools of Coordination*

Originally, corporate governance issues arise from the separation between ownership and control (BERLE AND MEANS, 1932). In our framework[4], the separation between ownership and control is about time. First, ownership, *i.e.* the legal source of power, provides the entrepreneur with the right to determine access to the critical resource now and in the future. Indeed, as he owns the initial critical resource of the firm, he has some exclusive residual rights of control. The right to forbid some agents to use or work with resources is part of his rights of decision. Secondly, control only gives to the owner the right to determine current access. Then, control may temporarily enhance the economic power of the owner. Critical resources, that cannot be owned but only controlled, even for the time being, give the same residual rights of control as ownership does. Specialized workers are key agents who increase power by investing specifically in their human capital.
Altogether, the structural organization of the firm and the internal division of labour are an expression of power relationships and found a model of governance of the human capital-intensive firm: the owner of the critical resource does not need that other stakeholders excessively develop their human capital because they wish organizational rents will be protected. In a symmetric way, stakeholders search for enriching their tasks and for making firm-specific investments. By specializing and by accumulating knowledge and competencies, stakeholders make themselves indispensable in the firm and enhance their outside value.

As the distinctive value of human capital-intensive firms comes from resources that cannot be easily appropriated, the boundaries of the firm are often altered. Stakeholders can leave the firm with their human capital; so they can leave the firm with a part of the firm. Specialized employees get a negotiation power through mutual dependencies they have created. Negotiation power relies on the ability of stakeholders to make firm-specific investments: the more internal and external stakeholders specifically invest, the more rents to share within the coalition will be significant. Moreover, the accumulation of power in the hands of many stakeholders deteriorates their investment behavior. In this context, the risk of hold-up is high and the organizational structure of the firm can be changed. By ensuring them an equitable and attractive rent-sharing, the entrepreneur encourages the stakeholders to continue investing in the future. Because the possibility of renegotiation jeopardizes long-term commitments,

4 In this paper, we analyse the case of an entrepreneurial firm based on its human assets. Results would approximately be the same in a managerial enterprise built around its human assets except the fact ownership and control would be assumed by two kinds of agents, shareholders, on the one hand, and managers, on the other hand.

growth prospects are crucial in making the promise of future rents credible. If growth prospects diminish, then key stakeholders may lose the incentives to specialize. These stakeholders may be encouraged to leave the firm, changing its organizational form. In other words, specialized stakeholders can expropriate a large fraction of the value of the firm by developing their outside opportunities[5].
As power and rents are not concentrated but diffused, even outside the legal boundaries of the firm (as is the case for subcontractors essential for the firm), the main objective of corporate governance is to protect the integrity of the firm. In fact, the major corporate governance problem comes down to "how to prevent conflicts among stakeholders from paralyzing or even destroying the firm" (ZINGALES [2000, p. 1648]).

Capital structure can be used to motivate the owners of critical resources to go on making firm-specific investments. Outside equities can lock-in relationships between stakeholders so that the firm can appropriate a fraction of rents generated and can protect its long-term viability. The solution consists in associating key stakeholders (employees, suppliers, customers, etc.) to the financial capital structure of the firm (HEGE, 2001). The role of these funds would be to preserve the firm as a nexus of specific investments, by making stakeholders' interests converge. This modality to govern within the firm would reduce potential sources of conflicts. Moreover, the generalized award of stock options to employees remains an important trend in corporate governance in order to compensate and thus in order to retain employees (HOLMSTROM AND KAPLAN, 2001; OYER AND SCHAEFER, 2005). While rights of control associated with ownership may have diminished, the role of ownership in coordinating stakeholders may have increased (RAJAN AND ZINGALES, 2000). Another privileged instrument of corporate governance could be a better board representation of decisive stakeholders (HILLMAN, KEIM AND LUCE, 2001). Finally, setting up a system of job rotation could reduce hold-up problems in the human capital-intensive firm (HALONEN-AKATWIJUKA, 2004).

As we focus on the human capital-intensive firm, investigations have to study mechanisms which give to the firm the power to motivate, to control, and to retain specific human capital in order to maximize its value. In the Critical Resource Theory, power comes from the control of critical resources within the firm. In these circumstances, the main objective is to provide stakeholders with incentives to continue their relationship with the firm so that the firm can get wealth indispensable for its productive activity. Thus, the governance of the human capital-intensive firm is based on a particular representation of the acquisition, the allocation and the exercise of power. Stakeholders are not only viewed as agents with divergent interests. Stakeholders are also and above all considered as complementary critical resources that enhance the value of the firm and ensure its durability. At the same time, such a "disciplinary" system of corporate governance (to control and to incite) is necessary for competitive firms to capture growth opportunities.

As we admit that specific human capital is central in many firms, we have attempted to develop a revised survey of the nature and the governance of the human capital-intensive firm. This approach inspires a new perception of the relationship between vertical integration and disintegration. In fact, taking into account an enlarged coordinating role of the firm, we argue that integration and disintegration can be viewed as different ways for the firm to coordinate the specialization of agents.

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5 This hold-up manifestation is significant because 71% of the firms recorded in the Inc 500 list would have been founded by talented employees that have imitated or only changed a growth opportunity built by the firm employing them before (BHIDE, 2000).

### 4 *Revisiting the Relationship between Integration and Disintegration*

The vision we develop of the human capital-intensive organization highlights three characteristics of the coordinating role of the firm:

- The role of the firm is rather an organizational role than a legal one. The power of the firm does not depend on its legal structure. It relies on the active capacity of the firm to organize the division of labour. The role of the firm consists in managing a whole combination of complementarities between knowledge, skills and capabilities. Actually, the firm does not only aim to deal with traditional hold-up problems;
- The central role of the firm is to organize productive activities. Coordination within the firm does not only suppose that a unique agent holds all the residual rights of control. The firm requires a set of coordinating instruments in order to handle the specialization of agents;
- The firm can extend its coordinating role to agents who work outside its legal boundaries.

These three features are crucial to understand the nature of the link between vertical integration and disintegration.

First, vertical disintegration must be viewed as an organizational choice. Vertical disintegration does not stand for mere markets. When a firm collaborates with a legally independent agent, the two parties need, as for employees within the firm, to specialize their human capital; the two parties need to access to the critical resource. Consequently, access would constitute the privileged mode of the governance of the firm built around its specific human capital. We argue this is true both for human capital inside and outside the legal boundaries of the firm.

Second, the relationship between integration and disintegration can be formally re-examined on the basis of economic coordination issues. In fact, the objective of pooling the efforts of complementary agents involves redefining the link between integration and disintegration. Assets specificity always causes an economic dependency between agents. Agents are valuable insofar as they are working together. Yet, a risk of strategic exploitation of the relationship can arise from this economic dependency. In the Incomplete Contracts Theory, the allocation of property rights neutralizes the negative effects of the economic dependency by introducing a legal dependency. Ownership makes agents subordinate to each other[6]. Thus, the legal dependency or independency (which means integration or disintegration) represents the core of the coordinating role of productive activities. In the Incomplete Contracts Theory, integration and disintegration symbolize the two traditional poles of organizing economic activities. The focus on the human capital-intensive firm modifies the way to study the mutual and economic dependency between agents. The economic dependency cannot be solved by introducing a legal dependency because human capital cannot be legally appropriated in a privative way. That is why specialization, regulated by access to a critical resource, becomes the main coordinating tool. Besides, the issue of coordinating specialized stakeholders relates to agents inside and outside the firm. The coordinating role of the firm goes through its legal boundaries. The firm has to control relationships with its key employees, but also with its key suppliers, clients, subcontractors, etc. The firm coordinates the specialization of agents in the limits of its economic (or functional) boundaries. Therefore, integration and disintegration do not stand for hierarchy and market; integration and disintegration are two coordinating methods which differ as far as the governance of the specialization of agents is concerned.

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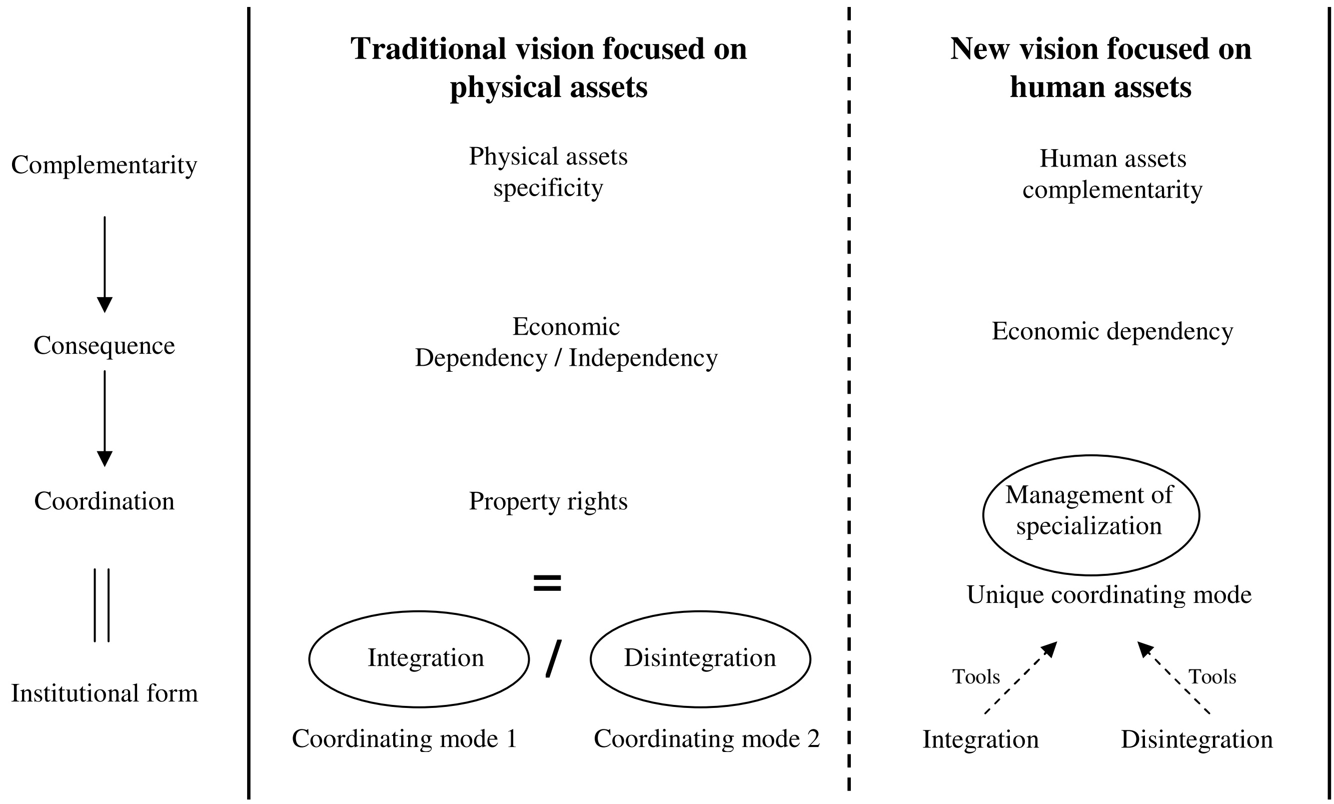
6 Besides, the owner of physical assets can escape from the economic dependency.

They characterize two states of organizing production and coordinating the specialization of agents and resources by the firm (GIBBONS, BAKER AND MURPHY, 2002).
Figure 1 illustrates this theoretical shifting in the way to explain the relationship between integration and disintegration. The firm is the superior institution to coordinate productive activities. Indeed, intra or inter-firms transactions are always coordinated by the firm. Contracts are not the only means to coordinate productive transactions. Coordination often occurs upstream the contracting scheme when the firm sets up the division of labour. Consequently, we do not describe the ownership of assets as an aim and a solution per se. Owning or not specific assets becomes integrated with a larger objective, the coordination of tasks which is materialized by a preliminary choice of division of labour.

*Figure 1*

Changing the link between integration and disintegration




*Source*: Authors

Third, as the coordinating role of the firm operates beyond its boundaries, it would be possible to exclude the notion of legal boundaries. We do not conclude to such an extreme interpretation. The permanent coordinating role of the firm, beyond its legal boundaries, does not exclude the question of the allocation of property rights. The allocation of property rights is not the final objective of the coordinating activity of the firm; it is rather an instrument to manage the specialization of agents. Actually, integration (*i.e.* the choice of an employment relationship) and disintegration (*i.e.* the choice of a cooperation relationship) do not develop the same instruments to deal with the specialization of agents. In this context, for example, RAJAN AND ZINGALES [2001] show that the hierarchical position is an essential tool in order to encourage employees to specialize. Nevertheless, this kind of incentive can only affect agents within the firm. Incentives methods based on wages can also be developed to motivate workers to make specific investments. When the firm needs somebody to specialize in a particular and temporary task, it will ask rather for an outsider. It is actually easier to have a cooperation relationship with an agent not legally linked with the firm. Reciprocally, an external stakeholder would not fear to invest in a "useless" capital in the mid-term. The legal status (integration or disintegration) does not represent the core of the problem of coordination; the legal status of the institutional forms rather assumes an instrumental weight. The question of ownership only occurs in a second period, with regard to a first objective of productive specialization of agents. Consequently, integration and disintegration can be effectively distinguished on the basis of their respective capacity to regulate the specialization of agents.

Lastly, such an original vision of the relationship between integration and disintegration opens up several research prospects. First, it is possible to find an analytical status to inter-firms relationships. In the Transaction Costs Theory, inter-firms relationships only exist as hybrid forms (WILLIAMSON, 1985). In fact, the existence of inter-firms relationships is simply justified by the will to combine hierarchical devices and market mechanisms. Their existence is not properly justified. In our framework, the firm is viewed as a nexus of specific investments in human capital. Thus, inter-firms relationships are in keeping with the general need for firms to look for innovative and competitive skills non-reproducible instantaneously. When these skills result from a combination of human assets developed in another firm, inter-firms relationships is the unique institutional mode of transaction. Second, we avoid analyzing historical movements of integration and disintegration as alternations between firm and market to coordinate industrial activities. We do not believe that a same productive activity follows, over time, fundamentally different logics of coordination. The link between integration and disintegration must be re-interpreted on the basis of the common objective of controlling the specialization of agents. Third, the notion of regulation of access gives new foundations to explain the current increase of inter-firms cooperations. We argue that inter-firms cooperations stand out as an adapted way to govern the specialization of tasks in a context of the growing importance of human capital in the production process of firms. The role of firms is always to coordinate productive specialization despite institutional changes (from the big integrated firm to the network-firm).

Fourth, the perimeter of the role of the firm cannot be modelled on the legal boundaries of the firm. Thus, the question of corporate activity must be thoroughly studied. As we focus on analyzing the firm built around its human capital, the ownership of assets does not delimitate the functional boundaries of the firm. Today, the boundaries of the firm are established in an organizational way by setting the limits of the activities coordinated by the firm. It is a question of better figuring out what the productive activity aims in order to precisely determine the group of agents that create value. The definition of the boundaries of the firm involves understanding the process of the specialization of tasks within the firm. Therefore, the traditional Incomplete Contracts Theory must be overcome so that one can re-examine the productive dimension of the firm, beyond incentives issues.

## *5 Conclusion*

Our paper re-examined the link between vertical integration and disintegration. We found that the nature of this link is determined by the way we define the coordinating role of the firm.
The Incomplete Contracts Theory presents vertical disintegration as the perfect counterfactual to vertical integration. In this perspective, the Incomplete Contracts Theory defines the firm as a combination of physical assets commonly owned. The firm is only understood as an answer to the hold-up problem. By studying the human capital-intensive firm, we show that the coordinating role of the firm needs to be reconsidered. The role of the firm is not limited to solve the problem of the expropriation of organizational rents. In order to capture growth opportunities, the firm has to control complementarities between agents who realize specific human capital investments. In this context, the Incomplete Contracts Theory must be extended towards two directions: developing new mechanisms ensuring incentives alignment and dealing with the division of productive tasks. Actually, the division of labour must be set as the foundation of the problem of ensuring incentives alignment.
This active coordinating role of the firm transforms the perception of the relationship between integration and disintegration. We advance that the firm ensures the division of tasks beyond its legal boundaries. Thus, the division of tasks concerns all agents directly employed by the firm but also all its key specialized stakeholders. Consequently, we conclude that integration and disintegration must be viewed as two different modes for the firm to coordinate the specialization of human assets within its economic (or functional) boundaries. In other words, integration and disintegration must be differentiated by the tools they give to the firm so that it can effectively govern the productive specialization all over its economic boundaries.

*References*


ALCHIAN, A. A., AND H. DEMSETZ [1972], “Production, Information Costs, and Economic Organization”, *American Economic Review,* 62, 777-795.

AOKI, M. [1984], *The Co-operative Game Theory of the Firm*, Oxford University Press – Clarendon Press: New York.

ARROUS, J. [1983], “La coordination entre les firmes et à l’intérieur des firmes. Vers une [re]définition de l’Economie Industrielle”, in: ADEFI : *Économie Industrielle : Problématique et Méthodologie*, Economica, Paris.

BAUDRY, B. [2004], “La question des frontières de la firme : Incitation et coordination dans la firme réseau", *Revue Economique*, 55, 247-274.

BERLE, A. A., AND G. C. MEANS [1932]. *The Modern Corporation and Private Property,* 1968, revised edition, Harcourt, Brace and World: New York.

BHIDE, A. V. [2000], *The Origin and the Evolution of New Businesses,* Oxford University Press: New York.

– – [1995], *Ownership and Control: Rethinking Corporate Governance for the Twenty-First Century*, Brookings Institution Press: Washington, DC.

BLAIR, M. M. [1999], “Firm-Specific Human Capital and Theories of the Firm, pp 58-90, in: M. M. Blair and M. J. Roe (eds), *Employees and Corporate Governance*, Brookings Institution Press: Washington, DC.

BLAIR, M. M., AND L. A. STOUT [1999], “A Team Production Theory of Corporate Law”, *Virginia Law Review*, 85, 248-328.

CASADESUS-MASANELL, R., AND D. F. SPULBER, [2000], “The Fable of Fisher Body”, *Journal of Law and Economics*. 43.

CHANDLER, A. D. JR [1977], *The Visible Hand: The Managerial Revolution in American Business,* The Belknap Press of Harvard University Press: Cambridge, MA.

CHRISTENSEN, C. M., M. VERLINDEN, AND G. WESTERMAN, [2002], “Disruption, Disintegration and the Dissipation of Differentiability”, *Industrial and Corporate Change*, 11, 955-993.

COASE, R. H. [1937], “The Nature of the Firm”, *Economica*, 4.

– – [2000], “The acquisition of Fisher Body by General Motors”, *Journal of Law and Economics*, 43, 15-31.

FREELAND, R. F. [2000], “Creating Hold-up through Vertical Integration: Fisher Body Revisited”, *Journal of Law and Economics*, 43, 33-66.

FRIGANT, V. [2005], “Vanishing hand versus systems integrators – Une revue de la littérature sur l’impact organisationnel de la modularité”, *Revue d'Economie Industrielle*, 109, 29-52.

GIBBONS, R. [2005], “Four formal[izable] theories of the firm?”, *Journal of Economic Behavior and Organization*, 58, 200-245.

GIBBONS, R., G. BAKER, AND K. J. MURPHY [2002], “Relational Contracts and the Theory of the Firm”, *Quarterly Journal of Economics*, 117, 39-84.

GROSSMAN, S. J., AND O. D. HART [1986], “The Costs and Benefits of Ownership: A Theory of Vertical and Lateral Integration”, *Journal of Political Economy*, 94, 691-719.

HALONEN-AKATWIJUKA, M. [2004], “Organizational Design, Technology and the Boundaries of the Firm”, Discussion Paper 02/540, University of Bristol, Department of Economics.

HART, O. D. [1989], “An Economist's Perspective on the theory of the firm”, in: Peter J. Buckley and J. Michie (eds), *Firms, organization and Contracts: A reader in Industrial Organization*, Oxford University Press: New-York.

– – [1995], *Firms, Contracts, and Financial Structures,* Oxford University Press: Oxford.

HART, O. D., AND J. MOORE [1990], “Property Rights and the Nature of the Firm”, *Journal of Political Economy*, 98, 1119-1158.

HEGE, U. [2001], “L’évaluation et le financement des start-up Internet”, *Revue Economique*. 52, 291-312.

HILLMAN, A. J., G. D KEIM, AND R. A. LUCE [2001], “Board Composition and Stakeholder Performance: Do Stakeholder Directors Make a Difference?”, *Business and Society*. 40, 295-314.

HOLMSTROM, B., AND S. N. KAPLAN [2001], “Corporate Governance and Merger Activity in the United States: Making Sense of the 1980s and 1990s”, *Journal of Economic Perspectives*, 15, 121-144.

KLEIN, B. [1991], “Vertical Integration as Organizational Ownership: the Fisher Body – General Motors Relationship Revisited”, in: O. E. Williamson and S. Winter (eds), *The Nature of the Firm: Origins, Evolution, and Development*, Oxford University Press: New York

– – [2000], “Fisher-General Motors and the Nature of the Firm”, *Journal of Law and Economics*, 43, 105-141.

KLEIN, B., R. G CRAWFORD, AND A. A. ALCHIAN [1978], “Vertical Integration, Appropriable Rents, and the Competitive Contracting Process”, *Journal of Law and Economics*, 21, 297-326.

LAMOREAUX, N. R., D. M. G. RAFF, AND P. TEMIN [2003], “Beyond Markets and Hierarchies: toward a New Synthesis of American Business History”, *American Historical Review,* 108, 404-433.

LANGLOIS, R. [2003], “The Vanishing Hand: The Changing Dynamics of Industrial Capitalism”, *Industrial and Corporate Change*, 12, 351-385.

LEIBLEIN, M. J., AND D. J. MILLER [2003], “An Empirical Examination of Transaction-and Firm-level Influences on the Vertical Boundaries of the Firm”, *Strategic Management Journal*, 24, 839-859.

MASKIN, E., AND J. TIROLE [1999], "Two Remarks on Property-Rights Literature", *Review of Economic Studies*, 66, 139-149.

MINISTERE DE L'ECONOMIE DES FINANCES ET DE L'INDUSTRIE [MINEFI] [2005], "Le développement du capital humain dans les entreprises", *Résultats d'une enquête de terrain menée dans les PME par les chargés de développements industriel des DRIRE.* décembre, 17p.

OYER, P., AND S. SCHAEFER [2005], "Why Do Some Firms Give Stock Options to All Employees?: An Empirical Examination of Alternative Theories", *Journal of Financial Economics,* 76, 99-133.

PENROSE, E. T. [1995], *The Theory of the Growth of the Firm,* Oxford University Press: Oxford.

PETERAF, M. A. [1993], "The Cornerstones of Competitive Advantage: a Resource-based View", *Strategic Management Journal*, 14, 179-191.

PRAHALAD, C. K., AND G. HAMEL [1990], "The Core Competence of the Corporation", *Harvard Business Review,* 68, 79-91.

PORTER LIEBESKIND, J. [2000], "Ownership, Incentives and Control in New Biotechnology Firms, pp. 299-333 in: M. M. Blair and T. A. Kochan (eds), *The New Relationship: Human Capital in the American Corporation.*, Brookings Institution Press: Washington, DC.

RAJAN, R. G., AND L. G. ZINGALES [1998], "Power in a Theory of the Firm", *Quarterly Journal of Economics*, 113, 387-432.

– – AND – – [2000], "The Governance of the New Enterprise", pp. 201-227 in: X. VIVES (eds), *Corporate governance: Theoretical and Empirical Perspectives*, Cambridge University Press: Cambridge.

– – AND – – [2001], "The Firm as a Dedicated Hierarchy: A Theory of the Origins and Growth of Firms", *Quarterly Journal of Economics*, 116, 805-851.

ROBERTS, J., AND E. VAN DEN STEEN [2000], "Stakeholder Interests, Human Capital Investment and Corporate Governance", Working Paper 1631, Stanford Graduate School of Business.

RUMELT, R. P. [1984], "Toward a Strategic Theory of the Firm", pp. 556-570 in: R. Lamb (eds), *Competitive Strategic Management*, Prentice Hall: Englewood Cliffs, NJ.

SESSI [2005], "Enquête sur les relations Inter-Entreprises en 2003" [ERIE].

WERNERFELT, B. [1984], "A Resource-Based View of the Firm", *Strategic Management Journal*, 5, 171-180.

WILLIAMSON, O. E. [1975], *Markets and Hierarchy*, Free Press: New York.

– – [1985], *The Economic Institution of Capitalism: Firms, Markets, Relational Contracting*, Free Press: New York.

ZINGALES, L. G. [2000], "In Search of New Foundations", *Journal of Finance*, 55, 1623-1653.

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